

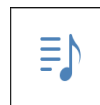


Armed Forces College of Medicine AFCM



Intracranial Hemorrhage

Dr Mohamed Bashir
MD Neurosurgery - Ain shams
University
Maadi Military Medical Compound



INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

1. Define intracranial haemorrhage.
2. Describe different types of intracranial haemorrhages.
3. List causes of intracranial haemorrhages.
4. Identify radiological finding of intracranial hemorrhages.



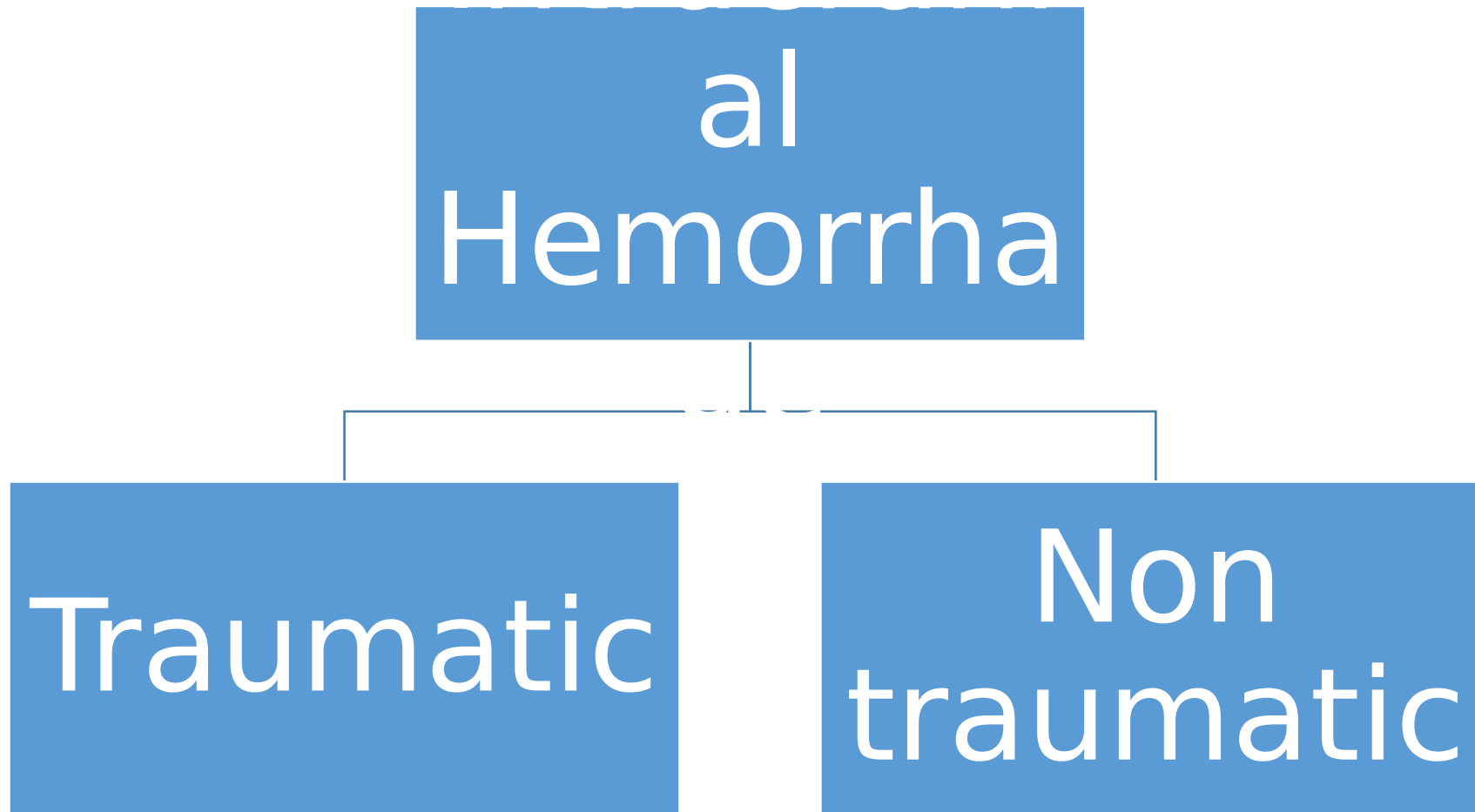
Intracranial hemorrhage



- Is a collective term including many different conditions characterized by extravascular accumulation of blood within different intracranial spaces.
- The intracranial haemorrhage is one of the most dangerous diseases with a very high mortality rate and great morbidity to alive cases.



Causes of Intracranial Hemorrhage



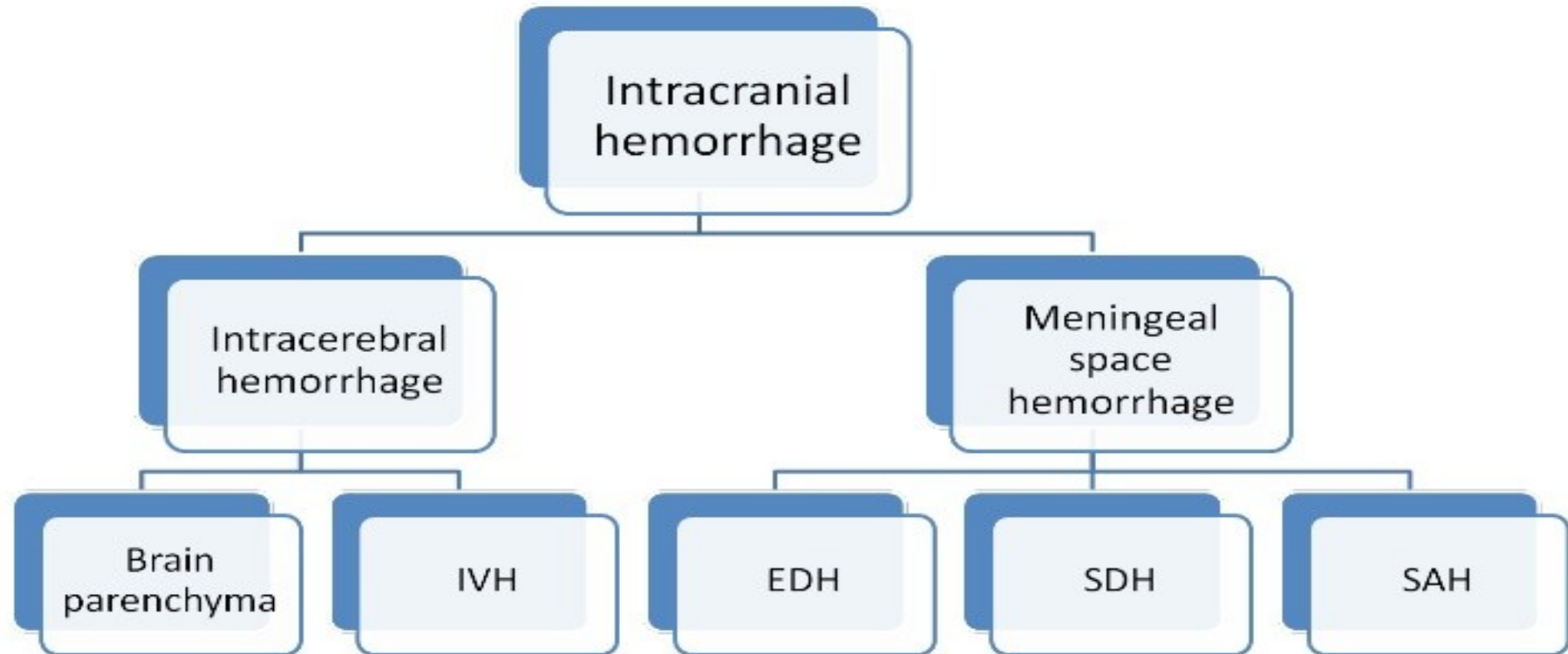
Causes of Intracranial Hemorrhage



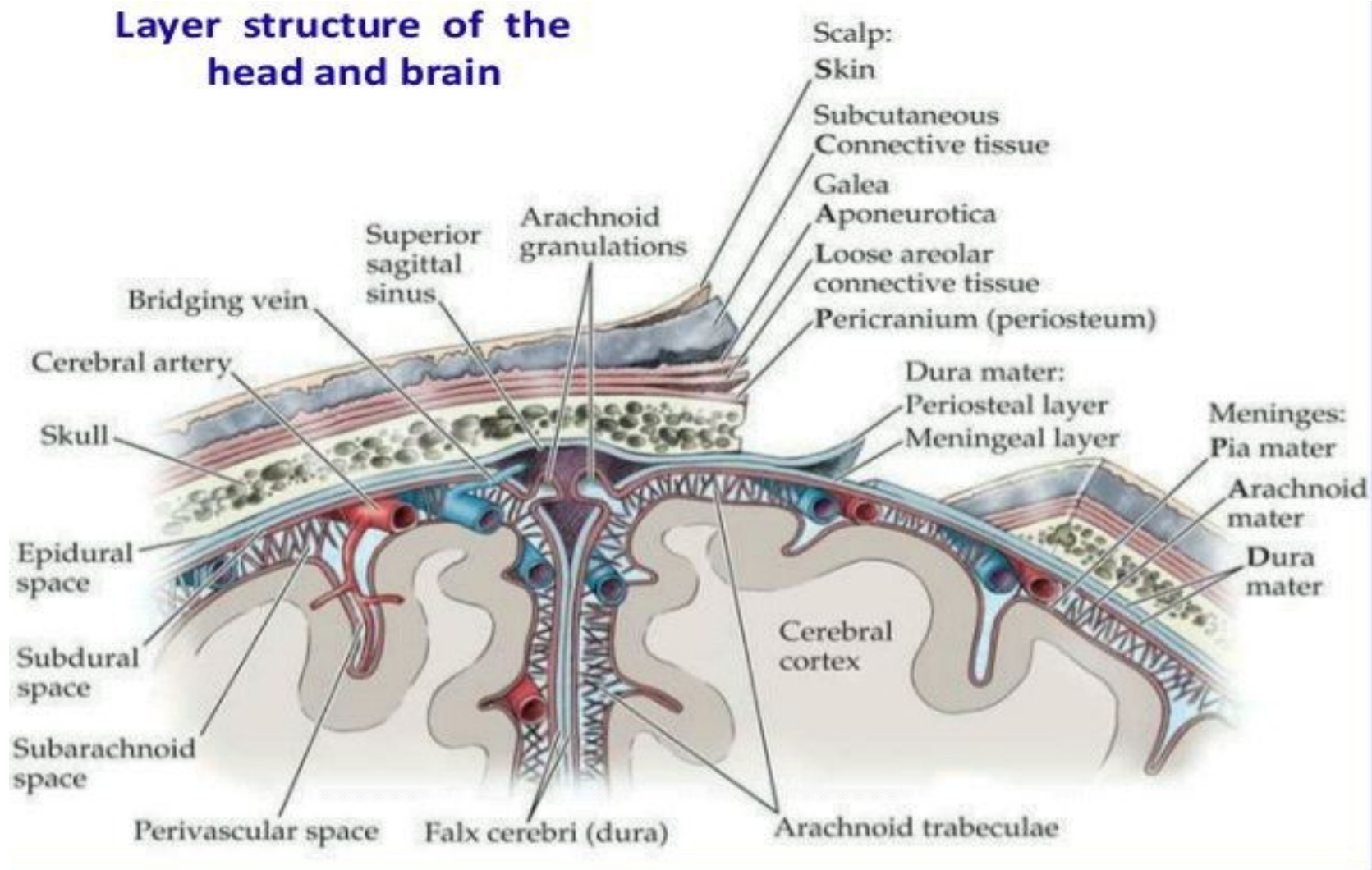
- Non traumatic causes of intracerebral hemorrhage:
- ❖ Hypertensive crisis: essential and eclampsia
- ❖ Vascular malformation: AVM, Aneurysm and cavernous haemangioma.
- ❖ Bleeding disorders.
- ❖ Anticoagulant.
- ❖ Amyloid angiopathy.
- ❖ Drug abuse: amphetamine and cocaine.



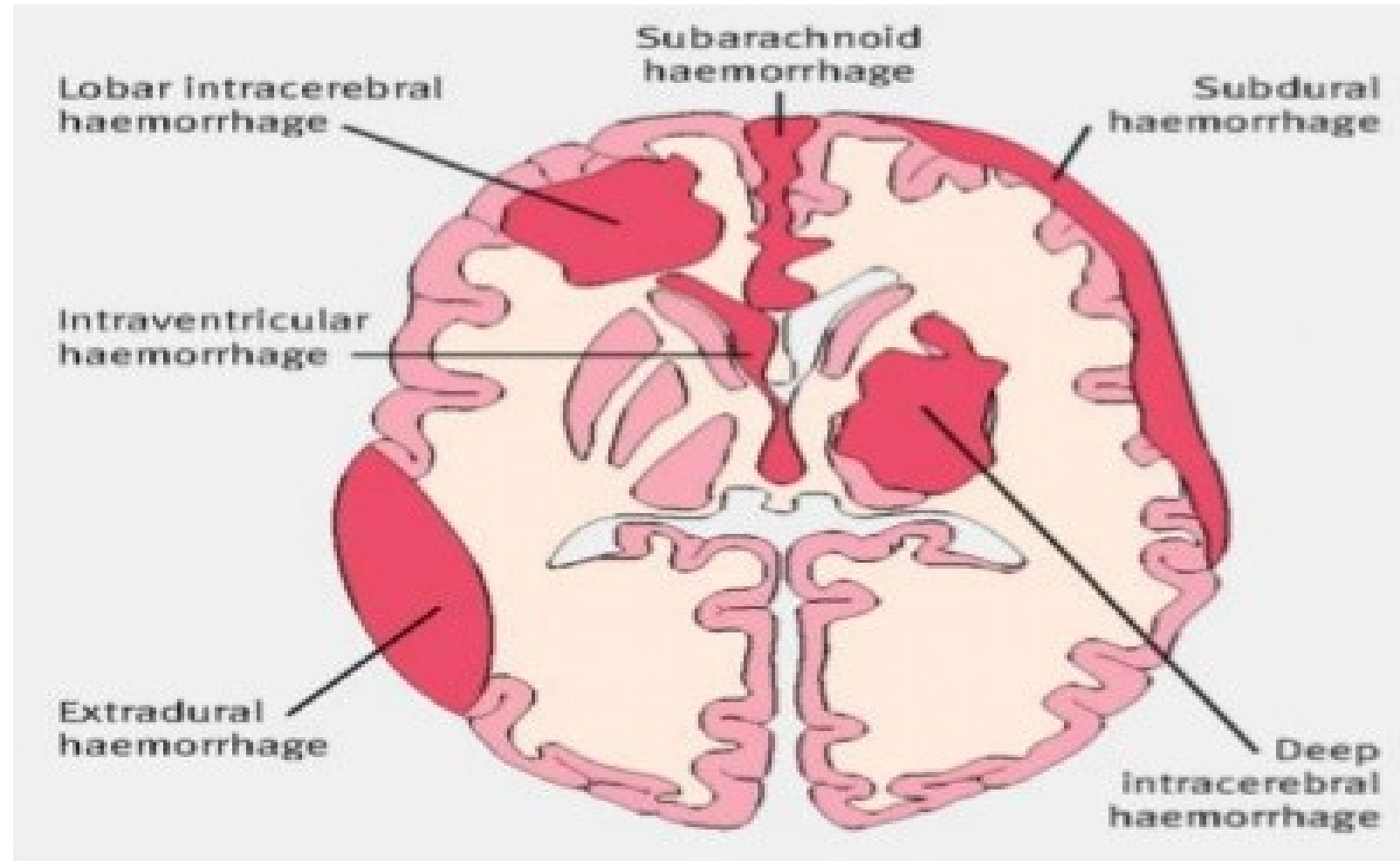
Types of Intracranial Hemorrhage



Types of Intracranial Hemorrhage



Types of Intracranial Hemorrhage



The Extradural Hematoma



- usually in **young adult** (where the dural easily strip from the skull bone).
- Most commonly **traumatic**.
- Account for **two third** of traumatic hematomas.
- Most commonly at the **temporal area**.
- Bleeding usually from: Middle meningeal artery.
dural venous sinus.
linear skull fracture.



Clinical picture of extradural hematoma

- headache.
- deteriorating conscious state.
- focal neurological signs (dilating pupil, hemiparesis).
- change in vital signs (hypertension, bradycardia).



Radiological diagnosis



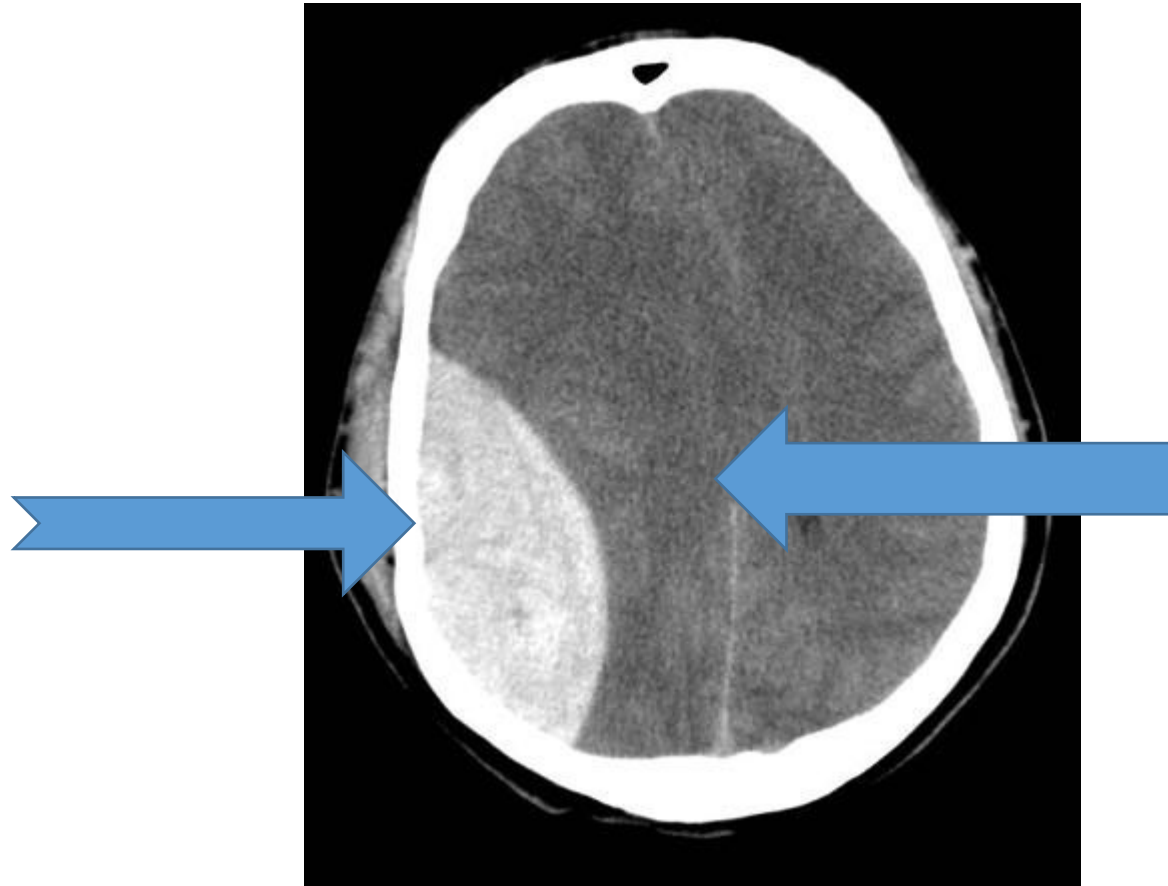
- The **CT scan is the radiological investigation of choice** and must be performed urgently if an extradural hematoma is considered a possibility.
- The CT scan will show the typical **hyperdense (white) biconvex** hematoma with compression of the underlying brain and distortion of the lateral ventricle.



Radiological diagnosis



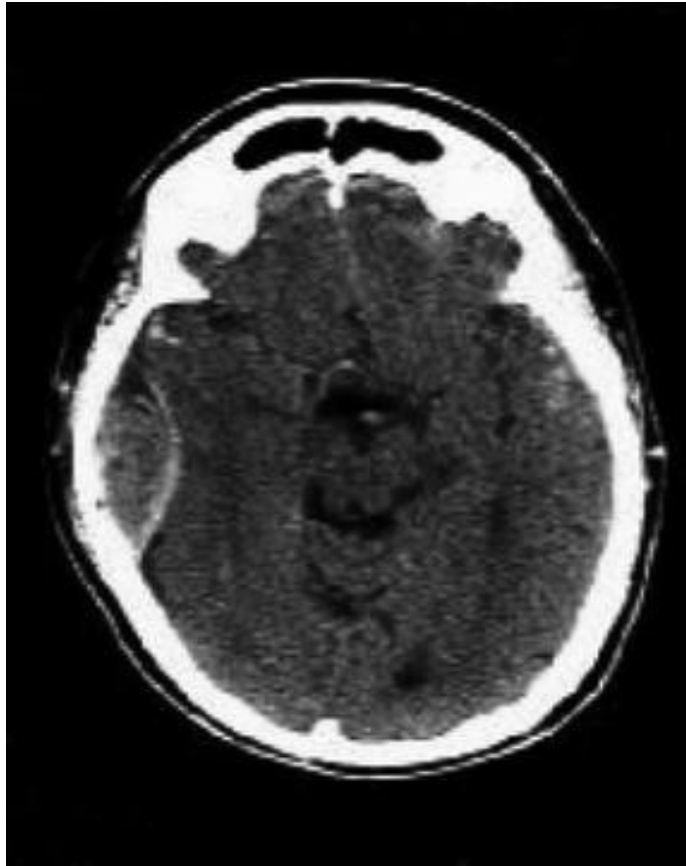
Hyperdense
e biconvex
hematoma



Midline shift to
left side



Radiological diagnosis



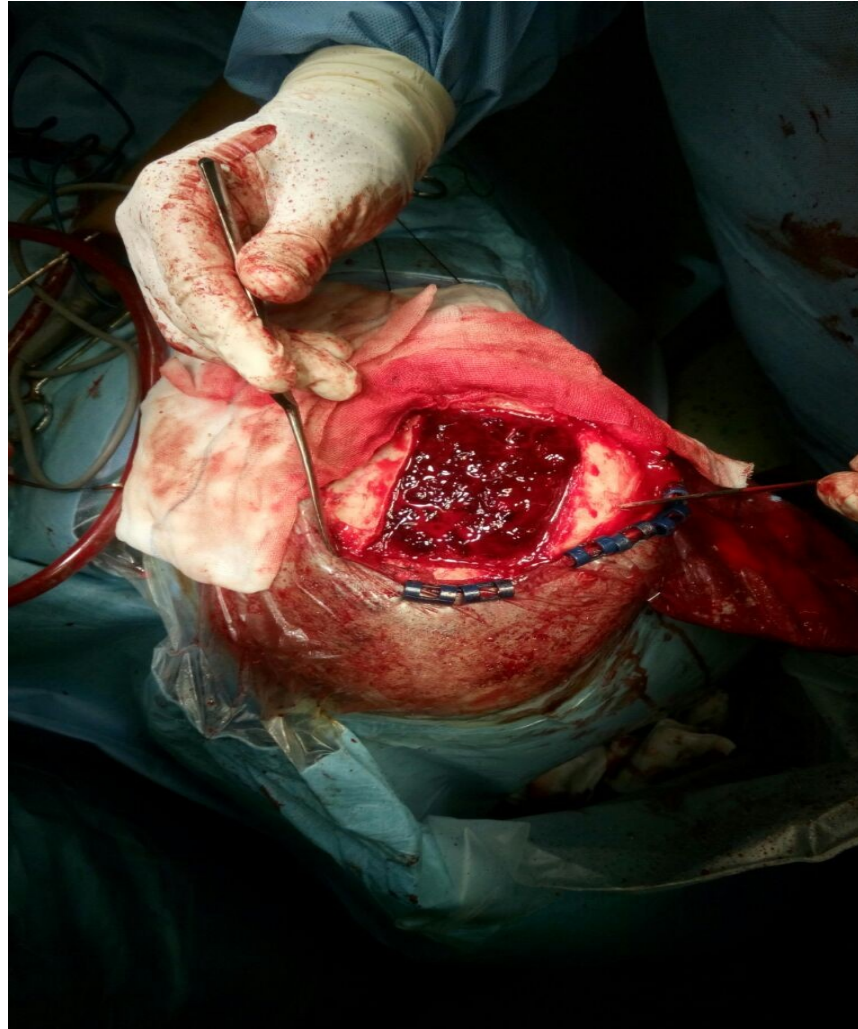
Management



- The treatment of extradural hematoma is **urgent craniotomy** with evacuation of the clot.
- **Infusion of mannitol** (20% solution, 1g/kg) or frusemide (20mg intravenously) may temporarily reduce the intracranial pressure during the transfer to the operating theatre.
- An extradural hematoma is a **surgical emergency** which will result in death if not removed promptly.



Management



The Subdural Hematoma



- Subdural hematomas have been classified into acute, subacute and chronic, depending on the time they become clinically evident following injury:
 - acute subdural hematoma—less than 3 days (is hyperdense (white)).
 - subacute subdural hematoma—4-21 days (is isodense).
 - chronic subdural hematoma—more than 21 days (is hypodense).



The Acute subdural hematoma



- The acute subdural hematoma frequently results from ***severe trauma*** to the head and commonly arises from ***cortical lacerations***.
- However, an acute subdural hematoma can result from a less severe trauma caused by ***rupture of a bridging vein*** or focal tear of a cortical artery, especially if the patient has been ***anticoagulated*** for other medical reasons



Clinical picture of acute subdural hematoma



- An acute subdural hematoma often presents in a patient with a severe head injury whose neurological state is either failing to improve or deteriorating.
- The features of deteriorating neurological state—decrease in conscious state and/or increase in lateralizing signs—should raise the possibility of a subdural hematoma.



Radiological diagnosis



- The CT scan will show the characteristic hyperdense hematoma, which is ***concave*** towards the brain, with compression of the underlying brain and distortion of the lateral



Management



- A craniotomy is nearly always necessary to evacuate an acute subdural hematoma.
- If the hematoma is liquid the blood can sometimes be washed out with gentle irrigation through burr holes.
- However if bleeding persists a craniotomy will be required for hemostasis.



The Chronic subdural hematoma



- Causes of chronic Subdural hematoma:
 - Traumatic: most commonly due to head injury
 - Non traumatic: results from rupture of minute fragile bridging veins from the surface of brain to dura in relatively atrophic mobile brain and in will be more evidenced in anticoagulated patient.



Clinical picture of Chronic subdural hematoma



- Raised intracranial pressure without significant localizing signs (headache, vomiting and drowsiness).
- Fluctuating drowsiness.
- A progressive dementia.
- Focal neurological signs may develop, particularly a hemiparesis with an extensor plantar response.



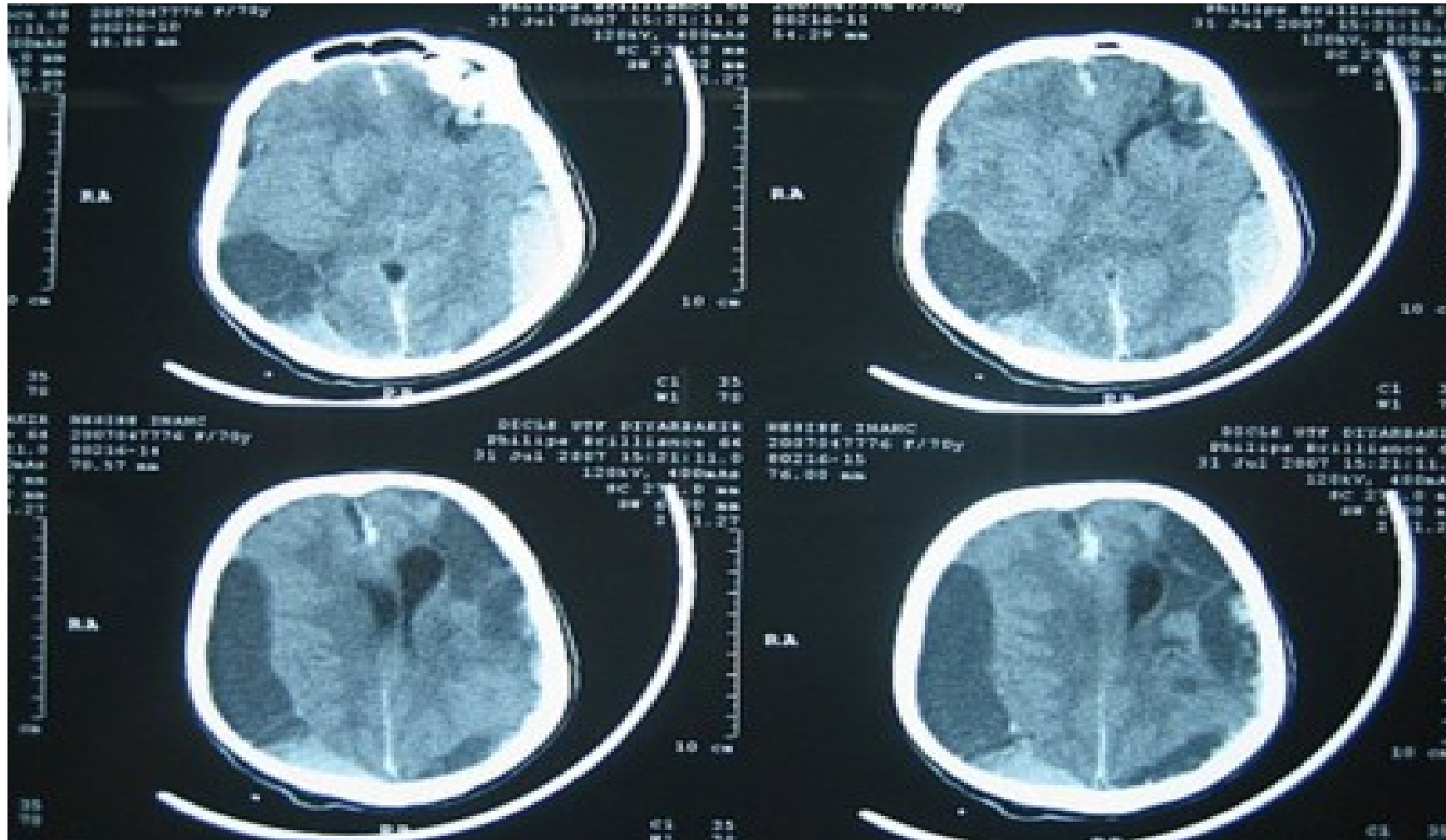
Radiological diagnosis



- the CT scan will show a hypodense, extracerebral collection causing compression of the underlying brain. In 25% of cases the hemi



Radiological diagnosis



Management



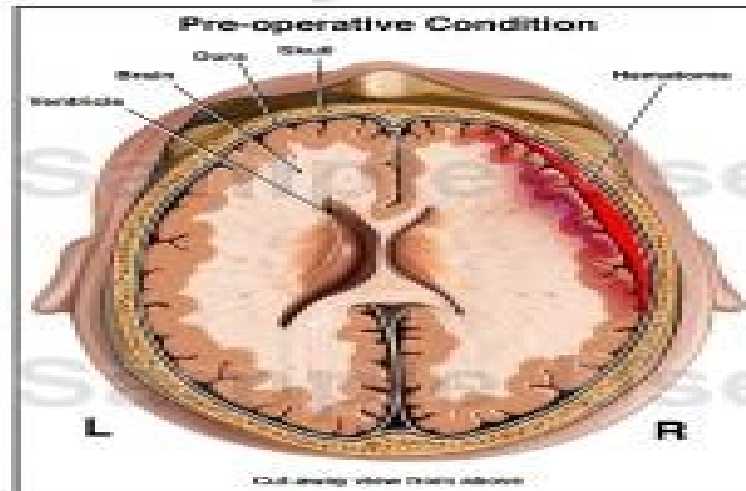
- The chronic subdural hematoma can be drained through burr holes or a craniotomy located over the hematoma.
- No attempt should be made to excise all the membrane of the hematoma.
- As these hematomas may be multiloculated it is advisable to insert more than one burr hole and to visualize the underlying brain at each site.



Management



Subdural Hematoma with Burr Hole Drainage



Surgical Drainage of Blood

A. Incisions are made into the right side of the head.

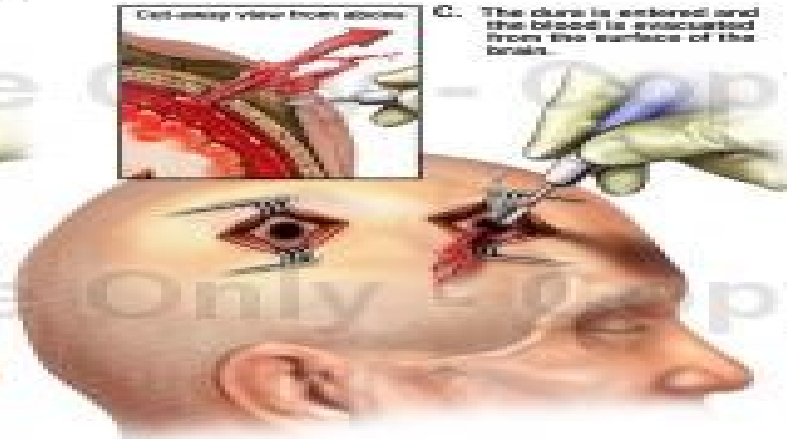


B. A hole is drilled through the skull at each incision site.



Cut-away view from above

C. The dura is entered and the blood is evacuated from the surface of the brain.



Management



Subarachnoid Hemorrhage



- Causes of Subarachnoid hematoma:
 - Traumatic: head injury
 - Non traumatic:
 - ❑ rupture of saccular aneurysm.
 - ❑ Bleeding from AVM.
 - ❑ Bleeding from mycotic aneurysm as a result of infected emboli.
 - ❑ Extension from intracerebral hematoma.



Clinical picture of Subarachnoid hematoma



- Headache.
- Photophobia.
- Nausea & Vomiting.
- Fits.
- Disturbed conscious level.
- Neck stiffness.
- Neurological deficit.



Clinical picture of Subarachnoid hematoma



Hunt and Hess Classification

Grade 1	Asymptomatic or minimal headache with slight nuchal rigidity
Grade 2	Moderate to severe headache, nuchal rigidity, no neurologic deficit other than cranial nerve palsy
Grade 3	Drowsiness, confusion, or mild focal deficit
Grade 4	Stupor, moderate to severe hemiparesis, possibly early decerebrate rigidity, and vegetative disturbances
Grade 5	Deep coma, decerebrate rigidity, moribund appearance



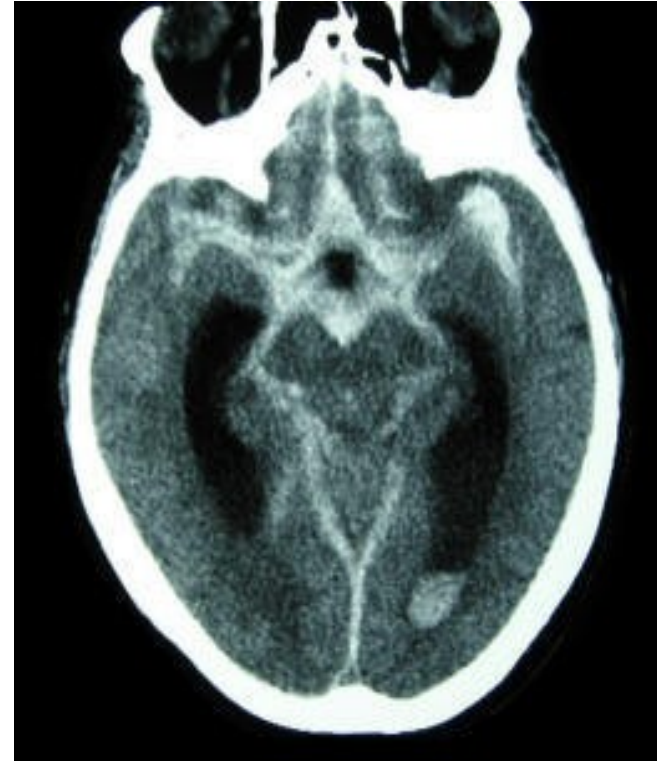
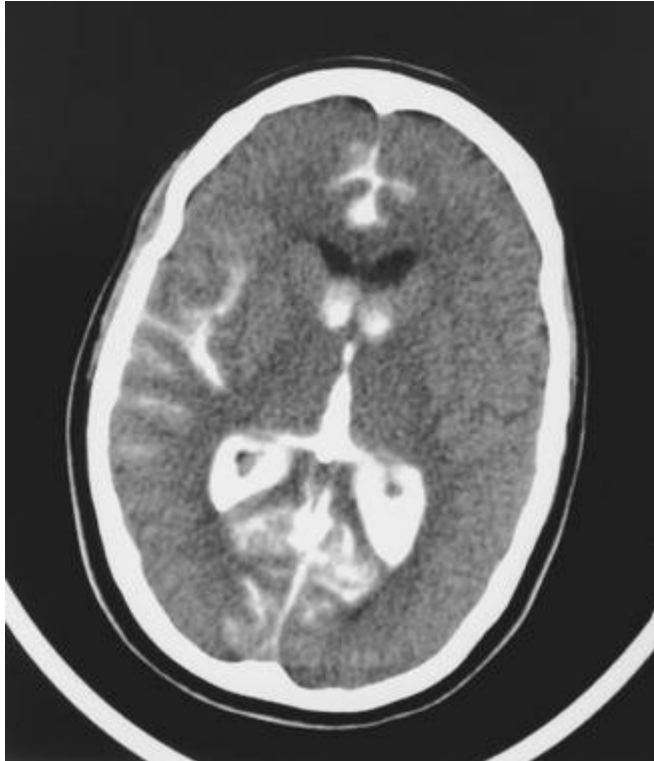
Radiological diagnosis



- the CT scan will show a hyperdensity area in the basal cisterns, sylvian fissure, interhemispheric fissure, sulci or a combination of them.
- The site of subarachnoid hemorrhage indicate the site of rupture vessel:
 - AcomA: in the interhemispheric fissure.
 - MCA: in sylvian fissure.
 - PcomA: in prepontine and ambient cistern.



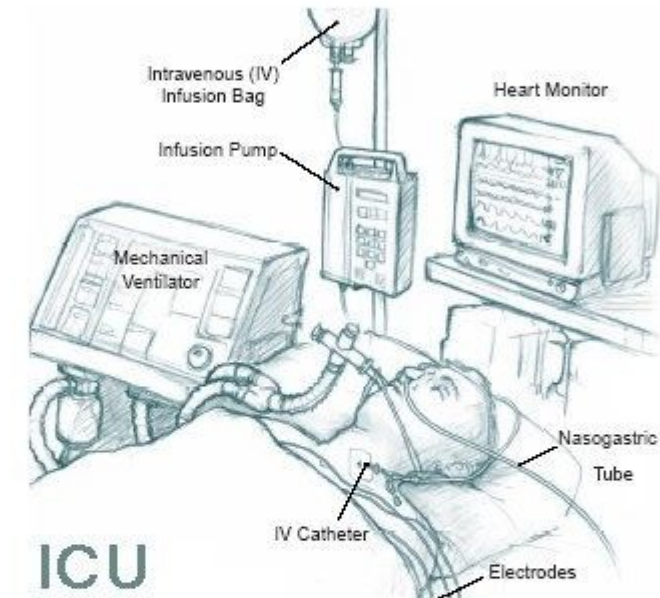
Radiological diagnosis



Management



- The medical treatment of subarachnoid he focuses on :
 - Protecting the airway.
 - Managing blood pressure.
 - Preventing rebleeding prior to treatm
 - Managing vasospasm.
 - Treating hydrocephalus.
 - Treating hyponatremia.
 - Preventing pulmonary embolisms.
 - Managing of rupture aneurysm.



Intracerebral Hemorrhage



- Causes of intracerebral hematoma:
 - Traumatic: head injury
 - Non traumatic:
 - ❑ Bleeding from AVM.
 - ❑ Bleeding from aneurysm.
 - ❑ Extension from subdural hematoma.
 - ❑ Bleeding disorders and anticoagulant.



Clinical picture of Intracerebral hematoma



- Headache.
- Nausea & Vomiting.
- Fits.
- Disturbed conscious level.
- Neurological deficit.



Radiological diagnosis



- the CT scan will show a hyperdensity area in the basal ganglia, brain tissue or brain stem.



Management



- A large intracerebral hematoma should be evacuated, unless the patient's neurological state is improving. Small intracerebral hematomas, particularly if multiple, are not removed but the clinician must be aware that they may expand and require subsequent evacuation.



Interventricular Hemorrhage



- Causes of interventricular hematoma:
 - Traumatic: head injury
 - Non traumatic:
 - ❑ Bleeding from AVM.
 - ❑ Bleeding from aneurysm.
 - ❑ Extension from intracerebral hematoma.
 - ❑ Bleeding disorders and anticoagulant.



Radiological diagnosis

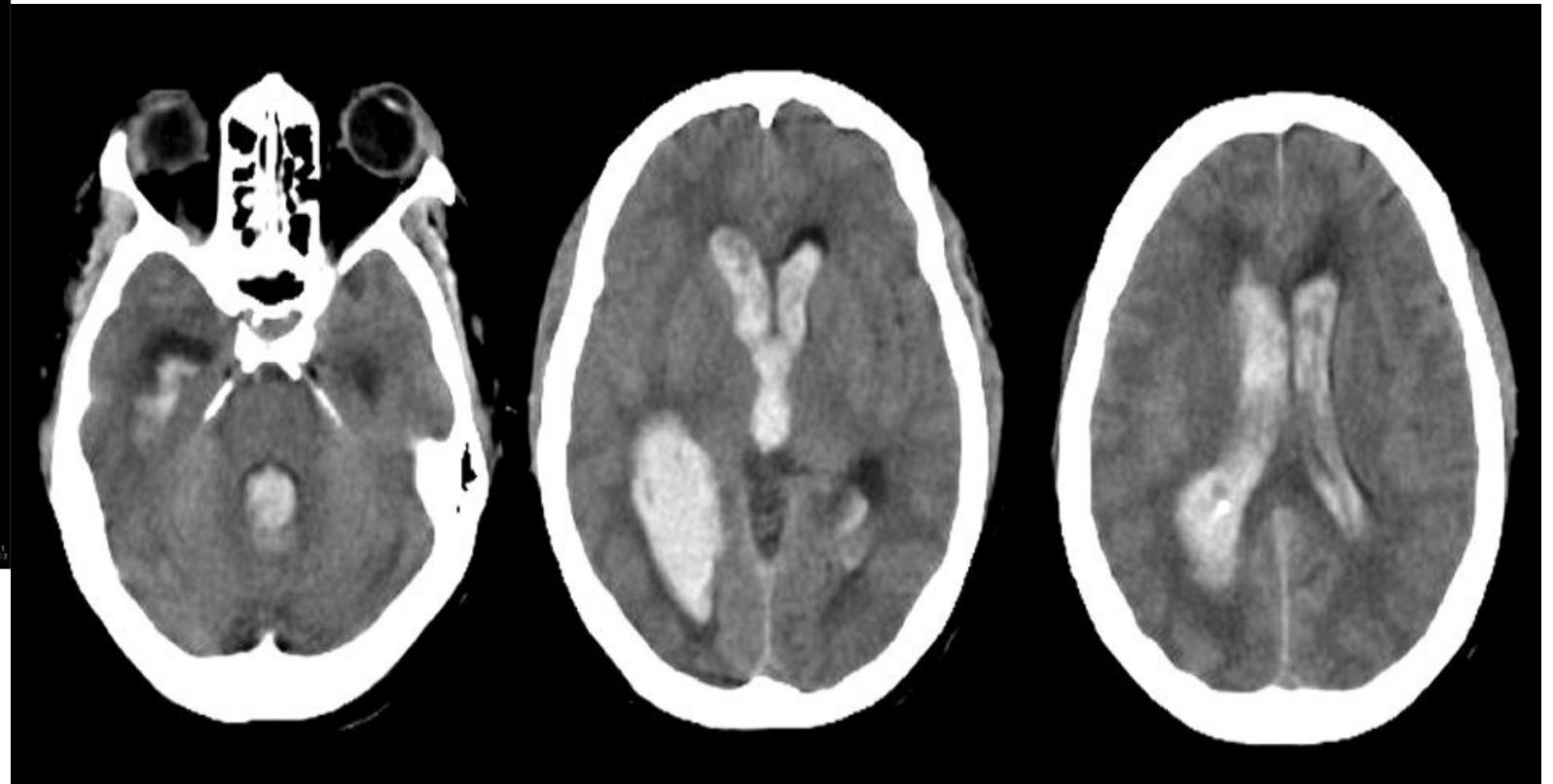


GRADING OF IVH

- ***Severity of hemorrhage may be defined on CT Scan.***
- ***Grade I: Isolated germinal matrix hemorrhage***
- ***Grade II: IVH without ventricular dilatation***
- ***Grade III: IVH with ventricular dilatation***
- ***Grade IV: There is IVH and parenchymal hemorrhage.***



Radiological diagnosis



Management



- *No specific treatment is available for IVH, it may be associated with other complications that require therapy.*
- *Maintain ABC.*
- *Seizures are aggressively treated with anticonvulsant drugs*
- *Anemia and coagulopathies requires transfusion with packed red blood cells or fresh frozen plasma.*
- *Shock and acidosis are treated with slow administration of sodium bicarbonate and fluid resuscitation.*



List cause of intracranial hemorrhage.



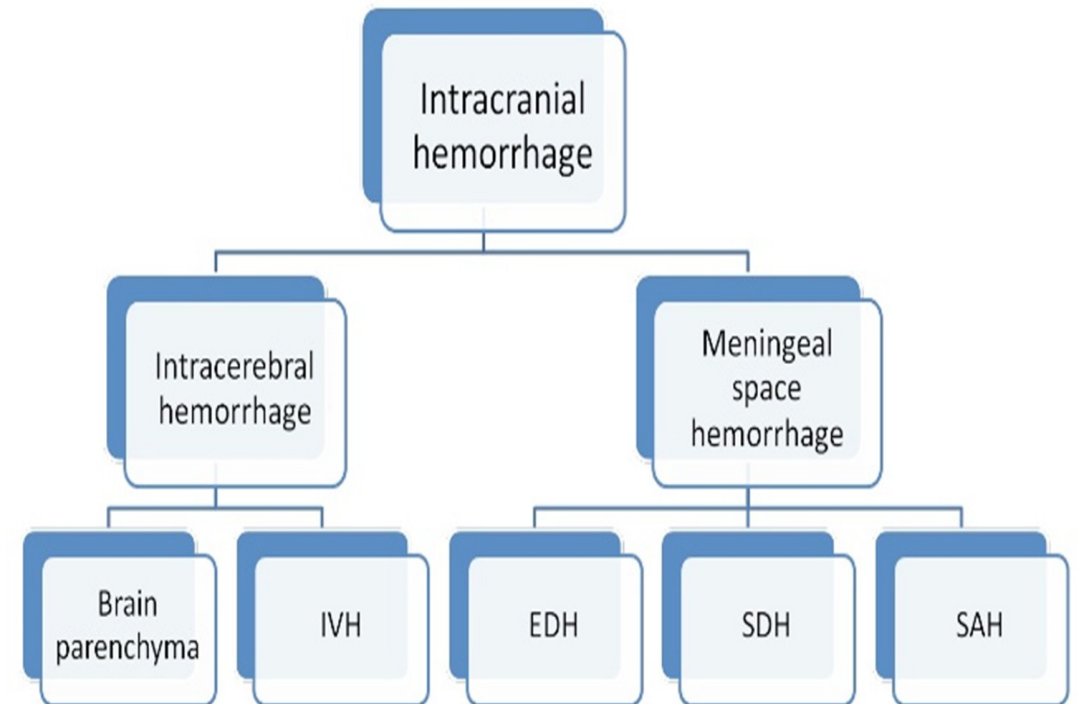
- Traumatic and non traumatic.
- Non traumatic causes:
 - Hypertensive crisis: essential and eclampsia
 - Vascular malformation: AVM, Aneurysm and cavernous haemangioma.
 - Bleeding disorders.
 - Anticoagulant.
 - Amyloid angiopathy.
 - Drug abuse: amphetamine and cocaine.
 - Tumors.
- This was shown in slide 5&6.



Describe different types of intracranial hemorrhage.



- Write types of intracranial hemorrhage as shown in figure.
- Then write the site of each hemorrhage, most common cause and the common presentation as shown in previous slides







Thank
you!!